

SEQUENCE LISTING

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Catharina Hultgren

<120> VACCINES CONTAINING RIBAVIRIN AND
METHODS OF USE THEREOF

<130> TRIPEP.23AUSC1C

<150> 10/104,966

<151> 2002-03-22

<150> 09/705,547

<151> 2000-11-03

<150> 60/229,175

<151> 2000-08-29

<160> 15

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<170> FastSEQ for Windows Version 4.0
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<210> 1

<211> 3011

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus sequence

<400> 1

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Arg	Arg	Pro	Gln	Asp	Val	Lys	Phe	Pro	Gly	Gly	Gly	Gln	Ile	Val	Gly
			20					25					30		
Gly	Val	Tyr	Leu	Leu	Pro	Arg	Arg	Gly	Pro	Arg	Leu	Gly	Val	Arg	Ala
		35					40					45			
Thr	Arg	Lys	Thr	Ser	Glu	Arg	Ser	Gln	Pro	Arg	Gly	Arg	Arg	Gln	Pro
	50					55					60				
Ile	Pro	Lys	Ala	Arg	Arg	Pro	Glu	Gly	Arg	Thr	Trp	Ala	Gln	Pro	Gly
65					70				75					80	
Tyr	Pro	Trp	Pro	Leu	Tyr	Gly	Asn	Glu	Gly	Cys	Gly	Trp	Ala	Gly	Trp
				85				90					95		
Leu	Leu	Ser	Pro	Arg	Gly	Ser	Arg	Pro	Ser	Trp	Gly	Pro	Thr	Asp	Pro
			100					105					110		
Arg	Arg	Arg	Ser	Arg	Asn	Leu	Gly	Lys	Val	Ile	Asp	Thr	Leu	Thr	Cys
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Gly	Phe	Ala	Asp	Leu	Met	Gly	Tyr	Ile	Pro	Leu	Val	Gly	Ala	Pro	Leu
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Gly	Gly	Ala	Ala	Arg	Ala	Leu	Ala	His	Gly	Val	Arg	Val	Leu	Glu	Asp
145					150				155					160	
Gly	Val	Asn	Tyr	Ala	Thr	Gly	Asn	Leu	Pro	Gly	Cys	Ser	Phe	Ser	Ile
				165				170					175		
Phe	Leu	Leu	Ala	Leu	Leu	Ser	Cys	Leu	Thr	Val	Pro	Ala	Ser	Ala	Tyr
			180					185					190		

Gln	Val	Arg	Asn	Ser	Ser	Gly	Leu	Tyr	His	Val	Thr	Asn	Asp	Cys	Pro	195	200	205
Asn	Ser	Ser	Val	Val	Tyr	Glu	Ala	Ala	Asp	Ala	Ile	Leu	His	Thr	Pro	210	215	220
Gly	Cys	Val	Pro	Cys	Val	Arg	Glu	Gly	Asn	Ala	Ser	Arg	Cys	Trp	Val	225	230	235
Ala	Val	Thr	Pro	Thr	Val	Ala	Thr	Arg	Asp	Gly	Lys	Leu	Pro	Thr	Thr	245	250	255
Gln	Leu	Arg	Arg	His	Ile	Asp	Leu	Leu	Val	Gly	Ser	Ala	Thr	Leu	Cys	260	265	270
Ser	Ala	Leu	Tyr	Val	Gly	Asp	Leu	Cys	Gly	Ser	Val	Phe	Leu	Val	Gly	275	280	285
Gln	Leu	Phe	Thr	Phe	Ser	Pro	Arg	His	His	Trp	Thr	Thr	Gln	Asp	Cys	290	295	300
Asn	Cys	Ser	Ile	Tyr	Pro	Gly	His	Ile	Thr	Gly	His	Arg	Met	Ala	Trp	305	310	315
Asn	Met	Met	Met	Asn	Trp	Ser	Pro	Thr	Ala	Ala	Leu	Val	Val	Ala	Gln	325	330	335
Leu	Leu	Arg	Ile	Pro	Gln	Ala	Ile	Met	Asp	Met	Ile	Ala	Gly	Ala	His	340	345	350
Trp	Gly	Val	Leu	Ala	Gly	Ile	Lys	Tyr	Phe	Ser	Met	Val	Gly	Asn	Trp	355	360	365
Ala	Lys	Val	Leu	Val	Val	Leu	Leu	Leu	Phe	Ala	Gly	Val	Asp	Ala	Glu	370	375	380
Thr	His	Val	Thr	Gly	Gly	Asn	Ala	Gly	Arg	Thr	Thr	Ala	Gly	Leu	Val	385	390	395
Gly	Leu	Leu	Thr	Pro	Gly	Ala	Lys	Gln	Asn	Ile	Gln	Leu	Ile	Asn	Thr	405	410	415
Asn	Gly	Ser	Trp	His	Ile	Asn	Ser	Thr	Ala	Leu	Asn	Cys	Asn	Glu	Ser	420	425	430
Leu	Asn	Thr	Gly	Trp	Leu	Ala	Gly	Leu	Phe	Tyr	Gln	His	Lys	Phe	Asn	435	440	445
Ser	Ser	Gly	Cys	Pro	Glu	Arg	Leu	Ala	Ser	Cys	Arg	Arg	Leu	Thr	Asp	450	455	460
Phe	Ala	Gln	Gly	Trp	Gly	Pro	Ile	Ser	Tyr	Ala	Asn	Gly	Ser	Gly	Leu	465	470	475
Asp	Glu	Arg	Pro	Tyr	Cys	Trp	His	Tyr	Pro	Pro	Arg	Pro	Cys	Gly	Ile	485	490	495
Val	Pro	Ala	Lys	Ser	Val	Cys	Gly	Pro	Val	Tyr	Cys	Phe	Thr	Pro	Ser	500	505	510
Pro	Val	Val	Val	Gly	Thr	Thr	Asp	Arg	Ser	Gly	Ala	Pro	Thr	Tyr	Ser	515	520	525
Trp	Gly	Ala	Asn	Asp	Thr	Asp	Val	Phe	Val	Leu	Asn	Asn	Thr	Arg	Pro	530	535	540
Pro	Leu	Gly	Asn	Trp	Phe	Gly	Cys	Thr	Trp	Met	Asn	Ser	Thr	Gly	Phe	545	550	555
Thr	Lys	Val	Cys	Gly	Ala	Pro	Pro	Cys	Val	Ile	Gly	Gly	Val	Gly	Asn	565	570	575
Asn	Thr	Leu	Leu	Cys	Pro	Thr	Asp	Cys	Phe	Arg	Lys	Tyr	Pro	Glu	Ala	580	585	590
Thr	Tyr	Ser	Arg	Cys	Gly	Ser	Gly	Pro	Arg	Ile	Thr	Pro	Arg	Cys	Met	595	600	605
Val	Asp	Tyr	Pro	Tyr	Arg	Leu	Trp	His	Tyr	Pro	Cys	Thr	Ile	Asn	Tyr	610	615	620
Thr	Ile	Phe	Lys	Val	Arg	Met	Tyr	Val	Gly	Gly	Val	Glu	His	Arg	Leu	625	630	635
Glu	Ala	Ala	Cys	Asn	Trp	Thr	Arg	Gly	Glu	Arg	Cys	Asp	Leu	Glu	Asp	640		

Arg	Asp	Arg	Ser	Glu	Leu	Ser	Pro	Leu	Leu	Leu	Ser	Thr	Thr	Gln	Trp
			660					665					670		
Gln	Val	Leu	Pro	Cys	Ser	Phe	Thr	Thr	Leu	Pro	Ala	Leu	Ser	Thr	Gly
		675					680					685			
Leu	Ile	His	Leu	His	Gln	Asn	Ile	Val	Asp	Val	Gln	Tyr	Leu	Tyr	Gly
	690				695					700					
Val	Gly	Ser	Ser	Ile	Ala	Ser	Trp	Ala	Ile	Lys	Trp	Glu	Tyr	Val	Val
705				710					715					720	
Leu	Leu	Phe	Leu	Leu	Leu	Ala	Asp	Ala	Arg	Val	Cys	Ser	Cys	Leu	Trp
			725					730						735	
Met	Met	Leu	Leu	Ile	Ser	Gln	Ala	Glu	Ala	Ala	Leu	Glu	Asn	Leu	Val
		740						745					750		
Ile	Leu	Asn	Ala	Ala	Ser	Leu	Ala	Gly	Thr	His	Gly	Leu	Val	Ser	Phe
	755					760						765			
Leu	Val	Phe	Phe	Cys	Phe	Ala	Trp	Tyr	Leu	Lys	Gly	Arg	Trp	Val	Pro
	770				775						780				
Gly	Ala	Val	Tyr	Ala	Leu	Tyr	Gly	Met	Trp	Pro	Leu	Leu	Leu	Leu	Leu
785				790				795						800	
Leu	Ala	Leu	Pro	Gln	Arg	Ala	Tyr	Ala	Leu	Asp	Thr	Glu	Val	Ala	Ala
			805					810						815	
Ser	Cys	Gly	Gly	Val	Val	Leu	Val	Gly	Leu	Met	Ala	Leu	Thr	Leu	Ser
		820						825					830		
Pro	Tyr	Tyr	Lys	Arg	Tyr	Ile	Ser	Trp	Cys	Met	Trp	Trp	Leu	Gln	Tyr
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Phe	Leu	Thr	Arg	Val	Glu	Ala	Gln	Leu	His	Val	Trp	Val	Pro	Pro	Leu
	850					855						860			
Asn	Val	Arg	Gly	Gly	Arg	Asp	Ala	Val	Ile	Leu	Leu	Thr	Cys	Val	Val
865				870					875					880	
His	Pro	Ala	Leu	Val	Phe	Asp	Ile	Thr	Lys	Leu	Leu	Leu	Ala	Ile	Phe
			885					890						895	
Gly	Pro	Leu	Trp	Ile	Leu	Gln	Ala	Ser	Leu	Leu	Lys	Val	Pro	Tyr	Phe
		900						905					910		
Val	Arg	Val	Gln	Gly	Leu	Leu	Arg	Ile	Cys	Ala	Leu	Ala	Arg	Lys	Ile
	915						920						925		
Ala	Gly	Gly	His	Tyr	Val	Gln	Met	Ala	Ile	Ile	Lys	Leu	Gly	Ala	Leu
	930					935						940			
Thr	Gly	Thr	Cys	Val	Tyr	Asn	His	Leu	Ala	Pro	Leu	Arg	Asp	Trp	Ala
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His	Asn	Gly	Leu	Arg	Asp	Leu	Ala	Val	Ala	Val	Glu	Pro	Val	Val	Phe
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Ser	Arg	Met	Glu	Thr	Lys	Leu	Ile	Thr	Trp	Gly	Ala	Asp	Thr	Ala	Ala
		980						985					990		
Cys	Gly	Asp	Ile	Ile	Asn	Gly	Leu	Pro	Val	Ser	Ala	Arg	Arg	Gly	Gln
	995					1000							1005		
Glu	Ile	Leu	Leu	Gly	Pro	Ala	Asp	Gly	Met	Val	Ser	Lys	Gly	Trp	Arg
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Leu	Leu	Ala	Pro	Ile	Thr	Ala	Tyr	Ala	Gln	Gln	Thr	Arg	Gly	Leu	Leu
1025				1030						1035				1040	
Gly	Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	Arg	Asp	Lys	Asn	Gln	Val	Glu
			1045					1050						1055	
Gly	Glu	Val	Gln	Ile	Val	Ser	Thr	Ala	Thr	Gln	Thr	Phe	Leu	Ala	Thr
		1060						1065					1070		
Cys	Ile	Asn	Gly	Val	Cys	Trp	Thr	Val	Tyr	His	Gly	Ala	Gly	Thr	Arg
	1075						1080						1085		
Thr	Ile	Ala	Ser	Pro	Lys	Gly	Pro	Val	Ile	Gln	Thr	Tyr	Thr	Asn	Val
	1090					1095						1100			

Asp	Gln	Asp	Leu	Val	Gly	Trp	Pro	Ala	Pro	Gln	Gly	Ser	Arg	Ser	Leu	1105	1110	1115	1120
Thr	Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp	Leu	Tyr	Leu	Val	Thr	Arg	His	1125	1130	1135	
Ala	Asp	Val	Ile	Pro	Val	Arg	Arg	Arg	Gly	Asp	Ser	Arg	Gly	Ser	Leu	1140	1145	1150	
Leu	Ser	Pro	Arg	Pro	Ile	Ser	Tyr	Leu	Lys	Gly	Ser	Ser	Gly	Gly	Pro	1155	1160	1165	
Leu	Leu	Cys	Pro	Thr	Gly	His	Ala	Val	Gly	Leu	Phe	Arg	Ala	Ala	Val	1170	1175	1180	
Cys	Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	Asp	Phe	Ile	Pro	Val	Glu	Asn	1185	1190	1195	1200
Leu	Glu	Thr	Thr	Met	Arg	Ser	Pro	Val	Phe	Thr	Asp	Asn	Ser	Ser	Pro	1205	1210	1215	
Pro	Ala	Val	Pro	Gln	Ser	Phe	Gln	Val	Ala	His	Leu	His	Ala	Pro	Thr	1220	1225	1230	
Gly	Ser	Gly	Lys	Ser	Thr	Lys	Val	Pro	Ala	Ala	Tyr	Ala	Ala	Lys	Gly	1235	1240	1245	
Tyr	Lys	Val	Leu	Val	Leu	Asn	Pro	Ser	Val	Ala	Ala	Thr	Leu	Gly	Phe	1250	1255	1260	
Gly	Ala	Tyr	Met	Ser	Lys	Ala	His	Gly	Val	Asp	Pro	Asn	Ile	Arg	Thr	1265	1270	1275	1280
Gly	Val	Arg	Thr	Ile	Thr	Thr	Gly	Ser	Pro	Ile	Thr	Tyr	Ser	Thr	Tyr	1285	1290	1295	
Gly	Lys	Phe	Leu	Ala	Asp	Ala	Gly	Cys	Ser	Gly	Gly	Ala	Tyr	Asp	Ile	1300	1305	1310	
Ile	Ile	Cys	Asp	Glu	Cys	His	Ser	Thr	Asp	Ala	Thr	Ser	Ile	Ser	Gly	1315	1320	1325	
Ile	Gly	Thr	Val	Leu	Asp	Gln	Ala	Glu	Thr	Ala	Gly	Ala	Arg	Leu	Val	1330	1335	1340	
Val	Leu	Ala	Thr	Ala	Thr	Pro	Pro	Gly	Ser	Val	Thr	Val	Ser	His	Pro	1345	1350	1355	1360
Asn	Ile	Glu	Glu	Val	Ala	Leu	Ser	Thr	Thr	Gly	Glu	Ile	Pro	Phe	Tyr	1365	1370	1375	
Gly	Lys	Ala	Ile	Pro	Leu	Glu	Val	Ile	Lys	Gly	Gly	Arg	His	Leu	Ile	1380	1385	1390	
Phe	Cys	His	Ser	Lys	Lys	Lys	Cys	Asp	Glu	Leu	Ala	Ala	Lys	Leu	Val	1395	1400	1405	
Ala	Leu	Gly	Ile	Asn	Ala	Val	Ala	Tyr	Tyr	Arg	Gly	Leu	Asp	Val	Ser	1410	1415	1420	
Val	Ile	Pro	Thr	Ser	Gly	Asp	Val	Val	Val	Val	Ser	Thr	Asp	Ala	Leu	1425	1430	1435	1440
Met	Thr	Gly	Phe	Thr	Gly	Asp	Phe	Asp	Ser	Val	Ile	Asp	Cys	Asn	Thr	1445	1450	1455	
Cys	Val	Thr	Gln	Thr	Val	Asp	Phe	Ser	Leu	Asp	Pro	Thr	Phe	Thr	Ile	1460	1465	1470	
Glu	Thr	Thr	Thr	Leu	Pro	Gln	Asp	Ala	Val	Ser	Arg	Thr	Gln	Arg	Arg	1475	1480	1485	
Gly	Arg	Thr	Gly	Arg	Gly	Lys	Pro	Gly	Ile	Tyr	Arg	Phe	Val	Ala	Pro	1490	1495	1500	
Gly	Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp	Ser	Ser	Val	Leu	Cys	Glu	Cys	1505	1510	1515	1520
Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu	Leu	Thr	Pro	Ala	Glu	Thr	Thr	1525	1530	1535	
Val	Arg	Leu	Arg	Ala	Tyr	Met	Asn	Thr	Pro	Gly	Leu	Pro	Val	Cys	Gln	1540	1545	1550	
Asp	His	Leu	Gly	Phe	Trp	Glu	Gly	Val	Phe	Thr	Gly	Leu	Thr	His	Ile				

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Asp	Ala	His	Phe	Leu	Ser	Gln	Thr	Lys	Gln	Ser	Gly	Glu	Asn	Phe	Pro
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Tyr	Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val	Cys	Ala	Arg	Ala	Gln	Ala	Pro
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Pro	Pro	Ser	Trp	Asp	Gln	Met	Arg	Lys	Cys	Leu	Ile	Arg	Leu	Lys	Pro
1605				1610				1615							
Thr	Leu	His	Gly	Pro	Thr	Pro	Leu	Leu	Tyr	Arg	Leu	Gly	Ala	Val	Gln
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Asn	Glu	Val	Thr	Leu	Thr	His	Pro	Ile	Thr	Lys	Tyr	Ile	Met	Thr	Cys
1635				1640				1645							
Met	Ser	Ala	Asp	Leu	Glu	Val	Val	Thr	Ser	Thr	Trp	Val	Leu	Val	Gly
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Gly	Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr	Cys	Leu	Ser	Thr	Gly	Cys	Val
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Val	Ile	Val	Gly	Arg	Ile	Val	Leu	Ser	Gly	Lys	Pro	Ala	Ile	Ile	Pro
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Asp	Arg	Glu	Val	Leu	Tyr	Gln	Glu	Phe	Asp	Glu	Met	Glu	Glu	Cys	Ser
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Gln	His	Leu	Pro	Tyr	Ile	Glu	Gln	Gly	Met	Met	Leu	Ala	Glu	Gln	Phe
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Lys	Gln	Lys	Ala	Leu	Gly	Leu	Leu	Gln	Thr	Ala	Ser	Arg	His	Ala	Glu
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Val	Ile	Thr	Pro	Ala	Val	Gln	Thr	Asn	Trp	Gln	Lys	Leu	Glu	Val	Phe
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Trp	Ala	Lys	His	Met	Trp	Asn	Phe	Ile	Ser	Gly	Ile	Gln	Tyr	Leu	Ala
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Gly	Leu	Ser	Thr	Leu	Pro	Gly	Asn	Pro	Ala	Ile	Ala	Ser	Leu	Met	Ala
1780				1785				1790							
Phe	Thr	Ala	Ala	Val	Thr	Ser	Pro	Leu	Thr	Thr	Gly	Gln	Thr	Leu	Leu
1795				1800				1805							
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Ala	Ala	Thr	Ala	Phe	Val	Gly	Ala	Gly	Leu	Ala	Gly	Ala	Ala	Leu	Asp
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Ser	Val	Gly	Leu	Gly	Lys	Val	Leu	Val	Asp	Ile	Leu	Ala	Gly	Tyr	Gly
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Ala	Gly	Val	Ala	Gly	Ala	Leu	Val	Ala	Phe	Lys	Ile	Met	Ser	Gly	Glu
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Val	Pro	Ser	Thr	Glu	Asp	Leu	Val	Asn	Leu	Leu	Pro	Ala	Ile	Leu	Ser
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Pro	Gly	Ala	Leu	Ala	Val	Gly	Val	Val	Phe	Ala	Ser	Ile	Leu	Arg	Arg
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Arg	Val	Gly	Pro	Gly	Glu	Gly	Ala	Val	Gln	Trp	Met	Asn	Arg	Leu	Ile
1905				1910				1915				1920			
Ala	Phe	Ala	Ser	Arg	Gly	Asn	His	Val	Ser	Pro	Thr	His	Tyr	Val	Pro
1925				1930				1935							
Glu	Ser	Asp	Ala	Ala	Ala	Arg	Val	Thr	Ala	Ile	Leu	Ser	Ser	Leu	Thr
1940				1945				1950							
Val	Thr	Gln	Leu	Leu	Arg	Arg	Leu	His	Gln	Trp	Ile	Ser	Ser	Glu	Cys
1955				1960				1965							
Thr	Thr	Pro	Cys	Ser	Gly	Ser	Trp	Leu	Arg	Asp	Ile	Trp	Asp	Trp	Ile
1970				1975				1980							
Cys	Glu	Val	Leu	Ser	Asp	Phe	Lys	Thr	Trp	Leu	Lys	Ala	Lys	Leu	Met
1985				1990				1995				2000			
Pro	Gln	Leu	Pro	Gly	Ile	Pro	Phe	Val	Ser	Cys	Gln	Arg	Gly	Tyr	Arg
2005				2010				2015							

2465		2470		2475		2480
Asp Ser His Tyr Gln Asp Val Leu Lys Glu Val Lys Ala Ala Ala Ser						
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Lys Val Lys Ala Asn Leu Leu Ser Val Glu Glu Ala Cys Ser Leu Ala						
	2500			2505		2510
Pro Pro His Ser Ala Lys Ser Lys Phe Gly Tyr Gly Ala Lys Asp Val						
	2515			2520		2525
Arg Cys His Ala Arg Lys Ala Val Ala His Ile Asn Ser Val Trp Lys						
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Asp Leu Leu Glu Asp Ser Val Thr Pro Ile Asp Thr Thr Ile Met Ala						
2545		2550		2555		2560
Lys Asn Glu Val Phe Cys Val Gln Pro Glu Lys Gly Gly Arg Lys Pro						
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Ala Arg Leu Ile Val Phe Pro Asp Leu Gly Val Arg Val Cys Glu Lys						
	2580			2585		2590
Met Ala Leu Tyr Asp Val Val Ser Lys Leu Pro Leu Ala Val Met Gly						
	2595			2600		2605
Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly Gln Arg Val Glu Phe Leu						
	2610			2615		2620
Val Gln Ala Trp Lys Ser Lys Lys Thr Pro Met Gly Leu Ser Tyr Asp						
2625		2630		2635		2640
Thr Arg Cys Phe Asp Ser Thr Val Thr Glu Ser Asp Ile Arg Thr Glu						
	2645			2650		2655
Glu Ala Ile Tyr Gln Cys Cys Asp Leu Asp Pro Gln Ala Arg Val Ala						
	2660			2665		2670
Ile Lys Ser Leu Thr Glu Arg Leu Tyr Val Gly Gly Pro Leu Thr Asn						
	2675			2680		2685
Ser Arg Gly Glu Asn Cys Gly Tyr Arg Arg Cys Arg Ala Ser Arg Val						
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Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr Arg Tyr Ile Lys Ala Arg						
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Ala Ala Cys Arg Ala Ala Gly Leu Gln Asp Cys Thr Met Leu Val Cys						
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Gly Asp Asp Leu Val Val Ile Cys Glu Ser Ala Gly Val Gln Glu Asp						
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Ala Ala Ser Leu Arg Ala Phe Thr Glu Ala Met Thr Arg Tyr Ser Ala						
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Pro Pro Gly Asp Pro Pro Gln Pro Glu Tyr Asp Leu Glu Leu Ile Thr						
	2770			2775		2780
Ser Cys Ser Ser Asn Val Ser Val Ala His Asp Gly Ala Gly Lys Arg						
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Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr Pro Leu Ala Arg Ala Ala						
	2805			2810		2815
Trp Glu Thr Ala Arg His Thr Pro Val Asn Ser Trp Leu Gly Asn Ile						
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Ile Met Phe Ala Pro Thr Leu Trp Ala Arg Met Ile Leu Met Thr His						
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Phe Phe Ser Val Leu Ile Ala Arg Asp Gln Leu Glu Gln Ala Leu Asn						
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Cys Glu Ile Tyr Gly Ala Cys Tyr Ser Ile Glu Pro Leu Asp Leu Pro						
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Pro Ile Ile Gln Arg Leu His Gly Leu Ser Ala Phe Ser Leu His Ser						
	2885			2890		2895
Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala Ala Cys Leu Arg Lys Leu						
	2900			2905		2910
Gly Val Pro Pro Leu Arg Ala Trp Arg His Arg Ala Trp Ser Val Arg						
	2915			2920		2925

Ala Arg Leu Leu Ala Arg Gly Gly Lys Ala Ala Ile Cys Gly Lys Tyr
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Leu Phe Asn Trp Ala Val Arg Thr Lys Leu Lys Leu Thr Pro Ile Thr
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Ala Ala Gly Arg Leu Asp Leu Ser Gly Trp Phe Thr Ala Gly Tyr Ser
2965 2970 2975
Gly Gly Asp Ile Tyr His Ser Val Ser His Ala Arg Pro Arg Trp Phe
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2995 3000 3005
Pro Asn Arg
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<210> 2

<211> 182

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus core protein sequence

<400> 2

Met Ser Thr Asn Pro Lys Pro Gln Arg Lys Thr Lys Arg Asn Thr Asn
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Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala
35 40 45
Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro
50 55 60
Ile Pro Lys Ala Arg Arg Pro Glu Gly Arg Thr Trp Ala Gln Pro Gly
65 70 75 80
Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp
85 90 95
Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly Pro Thr Asp Pro
100 105 110
Arg Arg Arg Ser Arg Asn Leu Gly Lys Val Ile Asp Thr Leu Thr Cys
115 120 125
Gly Phe Ala Asp Leu Met Gly Tyr Ile Pro Leu Val Gly Ala Pro Leu
130 135 140
Gly Gly Ala Ala Arg Ala Leu Ala His Gly Val Arg Val Leu Glu Asp
145 150 155 160
Gly Val Asn Tyr Ala Thr Gly Asn Leu Pro Gly Cys Ser Phe Ser Ile
165 170 175
Phe Leu Leu Ala Leu Leu
180

<210> 3

<211> 197

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus E1 protein sequence

<400> 3

Ser	Cys	Leu	Thr	Val	Pro	Ala	Ser	Ala	Tyr	Gln	Val	Arg	Asn	Ser	Ser
1				5					10				15		
Gly	Leu	Tyr	His	Val	Thr	Asn	Asp	Cys	Pro	Asn	Ser	Ser	Val	Val	Tyr
			20					25					30		
Glu	Ala	Ala	Asp	Ala	Ile	Leu	His	Thr	Pro	Gly	Cys	Val	Pro	Cys	Val
		35					40					45			
Arg	Glu	Gly	Asn	Ala	Ser	Arg	Cys	Trp	Val	Ala	Val	Thr	Pro	Thr	Val
	50					55					60				
Ala	Thr	Arg	Asp	Gly	Lys	Leu	Pro	Thr	Thr	Gln	Leu	Arg	Arg	His	Ile
65					70					75				80	
Asp	Leu	Leu	Val	Gly	Ser	Ala	Thr	Leu	Cys	Ser	Ala	Leu	Tyr	Val	Gly
			85						90					95	
Asp	Leu	Cys	Gly	Ser	Val	Phe	Leu	Val	Gly	Gln	Leu	Phe	Thr	Phe	Ser
			100					105					110		
Pro	Arg	His	His	Trp	Thr	Thr	Gln	Asp	Cys	Asn	Cys	Ser	Ile	Tyr	Pro
		115					120					125			
Gly	His	Ile	Thr	Gly	His	Arg	Met	Ala	Trp	Asn	Met	Met	Met	Asn	Trp
	130					135					140				
Ser	Pro	Thr	Ala	Ala	Leu	Val	Val	Ala	Gln	Leu	Leu	Arg	Ile	Pro	Gln
145					150					155				160	
Ala	Ile	Met	Asp	Met	Ile	Ala	Gly	Ala	His	Trp	Gly	Val	Leu	Ala	Gly
			165						170					175	
Ile	Lys	Tyr	Phe	Ser	Met	Val	Gly	Asn	Trp	Ala	Lys	Val	Leu	Val	Val
			180					185					190		
Leu	Leu	Leu	Phe	Ala											
		195													

<210> 4

<211> 350

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus E2 protein sequence

<400> 4

Gly	Val	Asp	Ala	Glu	Thr	His	Val	Thr	Gly	Gly	Asn	Ala	Gly	Arg	Thr
1				5					10				15		
Thr	Ala	Gly	Leu	Val	Gly	Leu	Leu	Thr	Pro	Gly	Ala	Lys	Gln	Asn	Ile
			20					25					30		
Gln	Leu	Ile	Asn	Thr	Asn	Gly	Ser	Trp	His	Ile	Asn	Ser	Thr	Ala	Leu
		35				40					45				
Asn	Cys	Asn	Glu	Ser	Leu	Asn	Thr	Gly	Trp	Leu	Ala	Gly	Leu	Phe	Tyr
	50					55					60				
Gln	His	Lys	Phe	Asn	Ser	Ser	Gly	Cys	Pro	Glu	Arg	Leu	Ala	Ser	Cys
65				70						75				80	
Arg	Arg	Leu	Thr	Asp	Phe	Ala	Gln	Gly	Trp	Gly	Pro	Ile	Ser	Tyr	Ala
			85					90						95	
Asn	Gly	Ser	Gly	Leu	Asp	Glu	Arg	Pro	Tyr	Cys	Trp	His	Tyr	Pro	Pro
			100					105					110		
Arg	Pro	Cys	Gly	Ile	Val	Pro	Ala	Lys	Ser	Val	Cys	Gly	Pro	Val	Tyr
		115					120					125			
Cys	Phe	Thr	Pro	Ser	Pro	Val	Val	Val	Gly	Thr	Thr	Asp	Arg	Ser	Gly
	130					135					140				
Ala	Pro	Thr	Tyr	Ser	Trp	Gly	Ala	Asn	Asp	Thr	Asp	Val	Phe	Val	Leu

145					150					155					160
Asn	Asn	Thr	Arg	Pro	Pro	Leu	Gly	Asn	Trp	Phe	Gly	Cys	Thr	Trp	Met
				165					170					175	
Asn	Ser	Thr	Gly	Phe	Thr	Lys	Val	Cys	Gly	Ala	Pro	Pro	Cys	Val	Ile
			180					185					190		
Gly	Gly	Val	Gly	Asn	Asn	Thr	Leu	Leu	Cys	Pro	Thr	Asp	Cys	Phe	Arg
		195					200					205			
Lys	Tyr	Pro	Glu	Ala	Thr	Tyr	Ser	Arg	Cys	Gly	Ser	Gly	Pro	Arg	Ile
	210					215					220				
Thr	Pro	Arg	Cys	Met	Val	Asp	Tyr	Pro	Tyr	Arg	Leu	Trp	His	Tyr	Pro
225					230					235					240
Cys	Thr	Ile	Asn	Tyr	Thr	Ile	Phe	Lys	Val	Arg	Met	Tyr	Val	Gly	Gly
			245						250					255	
Val	Glu	His	Arg	Leu	Glu	Ala	Ala	Cys	Asn	Trp	Thr	Arg	Gly	Glu	Arg
			260					265				270			
Cys	Asp	Leu	Glu	Asp	Arg	Asp	Arg	Ser	Glu	Leu	Ser	Pro	Leu	Leu	Leu
	275						280					285			
Ser	Thr	Thr	Gln	Trp	Gln	Val	Leu	Pro	Cys	Ser	Phe	Thr	Thr	Leu	Pro
	290					295					300				
Ala	Leu	Ser	Thr	Gly	Leu	Ile	His	Leu	His	Gln	Asn	Ile	Val	Asp	Val
305					310					315					320
Gln	Tyr	Leu	Tyr	Gly	Val	Gly	Ser	Ser	Ile	Ala	Ser	Trp	Ala	Ile	Lys
			325						330					335	
Trp	Glu	Tyr	Val	Val	Leu	Leu	Phe	Leu	Leu	Leu	Ala	Asp	Ala		
			340					345					350		

<210> 5

<211> 315

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus NS2 protein sequence

<400> 5

Arg	Val	Cys	Ser	Cys	Leu	Trp	Met	Met	Leu	Leu	Ile	Ser	Gln	Ala	Glu
1				5					10					15	
Ala	Ala	Leu	Glu	Asn	Leu	Val	Ile	Leu	Asn	Ala	Ala	Ser	Leu	Ala	Gly
			20					25					30		
Thr	His	Gly	Leu	Val	Ser	Phe	Leu	Val	Phe	Phe	Cys	Phe	Ala	Trp	Tyr
		35					40					45			
Leu	Lys	Gly	Arg	Trp	Val	Pro	Gly	Ala	Val	Tyr	Ala	Leu	Tyr	Gly	Met
	50					55					60				
Trp	Pro	Leu	Leu	Leu	Leu	Leu	Leu	Ala	Leu	Pro	Gln	Arg	Ala	Tyr	Ala
65					70					75				80	
Leu	Asp	Thr	Glu	Val	Ala	Ala	Ser	Cys	Gly	Gly	Val	Val	Leu	Val	Gly
			85						90					95	
Leu	Met	Ala	Leu	Thr	Leu	Ser	Pro	Tyr	Tyr	Lys	Arg	Tyr	Ile	Ser	Trp
			100					105					110		
Cys	Met	Trp	Trp	Leu	Gln	Tyr	Phe	Leu	Thr	Arg	Val	Glu	Ala	Gln	Leu
		115					120					125			
His	Val	Trp	Val	Pro	Pro	Leu	Asn	Val	Arg	Gly	Gly	Arg	Asp	Ala	Val
	130					135					140				
Ile	Leu	Leu	Thr	Cys	Val	Val	His	Pro	Ala	Leu	Val	Phe	Asp	Ile	Thr
145					150					155					160
Lys	Leu	Leu	Leu	Ala	Ile	Phe	Gly	Pro	Leu	Trp	Ile	Leu	Gln	Ala	Ser

				165					170					175			
Leu	Leu	Lys	Val	Pro	Tyr	Phe	Val	Arg	Val	Gln	Gly	Leu	Leu	Arg	Ile		
			180					185					190				
Cys	Ala	Leu	Ala	Arg	Lys	Ile	Ala	Gly	Gly	His	Tyr	Val	Gln	Met	Ala		
		195					200					205					
Ile	Ile	Lys	Leu	Gly	Ala	Leu	Thr	Gly	Thr	Cys	Val	Tyr	Asn	His	Leu		
	210					215					220						
Ala	Pro	Leu	Arg	Asp	Trp	Ala	His	Asn	Gly	Leu	Arg	Asp	Leu	Ala	Val		
225				230					235						240		
Ala	Val	Glu	Pro	Val	Val	Phe	Ser	Arg	Met	Glu	Thr	Lys	Leu	Ile	Thr		
			245					250					255				
Trp	Gly	Ala	Asp	Thr	Ala	Ala	Cys	Gly	Asp	Ile	Ile	Asn	Gly	Leu	Pro		
		260					265					270					
Val	Ser	Ala	Arg	Arg	Gly	Gln	Glu	Ile	Leu	Leu	Gly	Pro	Ala	Asp	Gly		
	275					280					285						
Met	Val	Ser	Lys	Gly	Trp	Arg	Leu	Leu	Ala	Pro	Ile	Thr	Ala	Tyr	Ala		
	290				295					300							
Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly	Cys	Ile	Ile							
305				310					315								

<210> 6

<211> 613

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus NS3 protein sequence

<400> 6

Thr	Ser	Leu	Thr	Gly	Arg	Asp	Lys	Asn	Gln	Val	Glu	Gly	Glu	Val	Gln		
1				5				10					15				
Ile	Val	Ser	Thr	Ala	Thr	Gln	Thr	Phe	Leu	Ala	Thr	Cys	Ile	Asn	Gly		
			20				25					30					
Val	Cys	Trp	Thr	Val	Tyr	His	Gly	Ala	Gly	Thr	Arg	Thr	Ile	Ala	Ser		
	35					40					45						
Pro	Lys	Gly	Pro	Val	Ile	Gln	Thr	Tyr	Thr	Asn	Val	Asp	Gln	Asp	Leu		
	50				55					60							
Val	Gly	Trp	Pro	Ala	Pro	Gln	Gly	Ser	Arg	Ser	Leu	Thr	Pro	Cys	Thr		
65				70				75					80				
Cys	Gly	Ser	Ser	Asp	Leu	Tyr	Leu	Val	Thr	Arg	His	Ala	Asp	Val	Ile		
			85				90				95						
Pro	Val	Arg	Arg	Arg	Gly	Asp	Ser	Arg	Gly	Ser	Leu	Leu	Ser	Pro	Arg		
	100					105					110						
Pro	Ile	Ser	Tyr	Leu	Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu	Leu	Cys	Pro		
	115					120					125						
Thr	Gly	His	Ala	Val	Gly	Leu	Phe	Arg	Ala	Ala	Val	Cys	Thr	Arg	Gly		
	130				135						140						
Val	Ala	Lys	Ala	Val	Asp	Phe	Ile	Pro	Val	Glu	Asn	Leu	Glu	Thr	Thr		
145				150				155							160		
Met	Arg	Ser	Pro	Val	Phe	Thr	Asp	Asn	Ser	Ser	Pro	Pro	Ala	Val	Pro		
			165				170				175						
Gln	Ser	Phe	Gln	Val	Ala	His	Leu	His	Ala	Pro	Thr	Gly	Ser	Gly	Lys		
	180					185					190						
Ser	Thr	Lys	Val	Pro	Ala	Ala	Tyr	Ala	Ala	Lys	Gly	Tyr	Lys	Val	Leu		
	195				200						205						
Val	Leu	Asn	Pro	Ser	Val	Ala	Ala	Thr	Leu	Gly	Phe	Gly	Ala	Tyr	Met		

210		215		220	
Ser Lys Ala His Gly Val Asp Pro Asn Ile Arg Thr Gly Val Arg Thr					
225		230		235	240
Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu					
	245		250		255
Ala Asp Ala Gly Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp					
	260		265		270
Glu Cys His Ser Thr Asp Ala Thr Ser Ile Ser Gly Ile Gly Thr Val					
	275		280		285
Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr					
	290		295		300
Ala Thr Pro Pro Gly Ser Val Thr Val Ser His Pro Asn Ile Glu Glu					
305		310		315	320
Val Ala Leu Ser Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile					
	325		330		335
Pro Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile Phe Cys His Ser					
	340		345		350
Lys Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val Ala Leu Gly Ile					
	355		360		365
Asn Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr					
	370		375		380
Ser Gly Asp Val Val Val Val Ser Thr Asp Ala Leu Met Thr Gly Phe					
385		390		395	400
Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln					
	405		410		415
Thr Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Thr					
	420		425		430
Leu Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg Gly Arg Thr Gly					
	435		440		445
Arg Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro Gly Glu Arg Pro					
	450		455		460
Ser Gly Met Phe Asp Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly					
465		470		475	480
Cys Ala Trp Tyr Glu Leu Thr Pro Ala Glu Thr Thr Val Arg Leu Arg					
	485		490		495
Ala Tyr Met Asn Thr Pro Gly Leu Pro Val Cys Gln Asp His Leu Gly					
	500		505		510
Phe Trp Glu Gly Val Phe Thr Gly Leu Thr His Ile Asp Ala His Phe					
	515		520		525
Leu Ser Gln Thr Lys Gln Ser Gly Glu Asn Phe Pro Tyr Leu Val Ala					
	530		535		540
Tyr Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp					
545		550		555	560
Asp Gln Met Arg Lys Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly					
	565		570		575
Pro Thr Pro Leu Leu Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr					
	580		585		590
Leu Thr His Pro Ile Thr Lys Tyr Ile Met Thr Cys Met Ser Ala Asp					
	595		600		605
Leu Glu Val Val Thr					
610					

<210> 7
 <211> 54
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Hepatitis C virus NS4A protein sequence

<400> 7

```
Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr
 1          5          10          15
Cys Leu Ser Thr Gly Cys Val Val Ile Val Gly Arg Ile Val Leu Ser
          20          25          30
Gly Lys Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Gln Glu Phe
          35          40          45
Asp Glu Met Glu Glu Cys
 50
```

<210> 8

<211> 260

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus NS4B protein sequence

<400> 8

```
Ser Gln His Leu Pro Tyr Ile Glu Gln Gly Met Met Leu Ala Glu Gln
 1          5          10          15
Phe Lys Gln Lys Ala Leu Gly Leu Leu Gln Thr Ala Ser Arg His Ala
          20          25          30
Glu Val Ile Thr Pro Ala Val Gln Thr Asn Trp Gln Lys Leu Glu Val
          35          40          45
Phe Trp Ala Lys His Met Trp Asn Phe Ile Ser Gly Ile Gln Tyr Leu
          50          55          60
Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro Ala Ile Ala Ser Leu Met
65          70          75          80
Ala Phe Thr Ala Ala Val Thr Ser Pro Leu Thr Thr Gly Gln Thr Leu
          85          90          95
Leu Phe Asn Ile Leu Gly Gly Trp Val Ala Ala Gln Leu Ala Ala Pro
          100          105          110
Gly Ala Ala Thr Ala Phe Val Gly Ala Gly Leu Ala Gly Ala Ala Leu
          115          120          125
Asp Ser Val Gly Leu Gly Lys Val Leu Val Asp Ile Leu Ala Gly Tyr
          130          135          140
Gly Ala Gly Val Ala Gly Ala Leu Val Ala Phe Lys Ile Met Ser Gly
145          150          155          160
Glu Val Pro Ser Thr Glu Asp Leu Val Asn Leu Leu Pro Ala Ile Leu
          165          170          175
Ser Pro Gly Ala Leu Ala Val Gly Val Val Phe Ala Ser Ile Leu Arg
          180          185          190
Arg Arg Val Gly Pro Gly Glu Gly Ala Val Gln Trp Met Asn Arg Leu
          195          200          205
Ile Ala Phe Ala Ser Arg Gly Asn His Val Ser Pro Thr His Tyr Val
          210          215          220
Pro Glu Ser Asp Ala Ala Ala Arg Val Thr Ala Ile Leu Ser Ser Leu
225          230          235          240
Thr Val Thr Gln Leu Leu Arg Arg Leu His Gln Trp Ile Ser Ser Glu
          245          250          255
Cys Thr Thr Pro
```

<210> 9

<211> 1040

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus NS5A/B protein sequence

<400> 9

Cys	Ser	Gly	Ser	Trp	Leu	Arg	Asp	Ile	Trp	Asp	Trp	Ile	Cys	Glu	Val	1	5	10	15
Leu	Ser	Asp	Phe	Lys	Thr	Trp	Leu	Lys	Ala	Lys	Leu	Met	Pro	Gln	Leu	20	25	30	
Pro	Gly	Ile	Pro	Phe	Val	Ser	Cys	Gln	Arg	Gly	Tyr	Arg	Gly	Val	Trp	35	40	45	
Arg	Gly	Asp	Gly	Ile	Met	His	Thr	Arg	Cys	His	Cys	Gly	Ala	Glu	Ile	50	55	60	
Thr	Gly	His	Val	Lys	Asn	Gly	Thr	Met	Arg	Ile	Val	Gly	Pro	Arg	Thr	65	70	75	80
Cys	Lys	Asn	Met	Trp	Ser	Gly	Thr	Phe	Phe	Ile	Asn	Ala	Tyr	Thr	Thr	85	90	95	
Gly	Pro	Cys	Thr	Pro	Leu	Pro	Ala	Pro	Asn	Tyr	Lys	Phe	Ala	Leu	Trp	100	105	110	
Arg	Val	Ser	Ala	Glu	Glu	Tyr	Val	Glu	Ile	Arg	Arg	Val	Gly	Asp	Phe	115	120	125	
His	Tyr	Val	Ser	Gly	Met	Thr	Thr	Asp	Asn	Leu	Lys	Cys	Pro	Cys	Gln	130	135	140	
Ile	Pro	Ser	Pro	Glu	Phe	Thr	Glu	Leu	Asp	Gly	Val	Arg	Leu	His		145	150	155	160
Arg	Phe	Ala	Pro	Pro	Cys	Lys	Pro	Leu	Leu	Arg	Glu	Glu	Val	Ser	Phe	165	170	175	
Arg	Val	Gly	Leu	His	Glu	Tyr	Pro	Val	Gly	Ser	Gln	Leu	Pro	Cys	Glu	180	185	190	
Pro	Glu	Pro	Asp	Val	Ala	Val	Leu	Thr	Ser	Met	Leu	Thr	Asp	Pro	Ser	195	200	205	
His	Ile	Thr	Ala	Glu	Ala	Ala	Gly	Arg	Arg	Leu	Ala	Arg	Gly	Ser	Pro	210	215	220	
Pro	Ser	Met	Ala	Ser	Ser	Ser	Ala	Ser	Gln	Leu	Ser	Ala	Pro	Ser	Leu	225	230	235	240
Lys	Ala	Thr	Cys	Thr	Ala	Asn	His	Asp	Ser	Pro	Asp	Ala	Glu	Leu	Ile	245	250	255	
Glu	Ala	Asn	Leu	Leu	Trp	Arg	Gln	Glu	Met	Gly	Gly	Asn	Ile	Thr	Arg	260	265	270	
Val	Glu	Ser	Glu	Asn	Lys	Val	Val	Ile	Leu	Asp	Ser	Phe	Asp	Pro	Leu	275	280	285	
Val	Ala	Glu	Glu	Asp	Glu	Arg	Glu	Val	Ser	Val	Pro	Ala	Glu	Ile	Leu	290	295	300	
Arg	Lys	Ser	Arg	Arg	Phe	Ala	Pro	Ala	Leu	Pro	Val	Trp	Ala	Arg	Pro	305	310	315	320
Asp	Tyr	Asn	Pro	Leu	Leu	Val	Glu	Thr	Trp	Lys	Lys	Pro	Asp	Tyr	Glu	325	330	335	
Pro	Pro	Val	Val	His	Gly	Cys	Pro	Leu	Pro	Pro	Pro	Arg	Ser	Pro	Pro	340	345	350	
Val	Pro	Pro	Pro	Arg	Lys	Lys	Arg	Thr	Val	Val	Leu	Thr	Glu	Ser	Thr				

Ser	Asn	Val	Ser	Val	Ala	His	Asp	Gly	Ala	Gly	Lys	Arg	Val	Tyr	Tyr		
			820					825					830				
Leu	Thr	Arg	Asp	Pro	Thr	Thr	Pro	Leu	Ala	Arg	Ala	Ala	Trp	Glu	Thr		
			835					840					845				
Ala	Arg	His	Thr	Pro	Val	Asn	Ser	Trp	Leu	Gly	Asn	Ile	Ile	Met	Phe		
			850					855					860				
Ala	Pro	Thr	Leu	Trp	Ala	Arg	Met	Ile	Leu	Met	Thr	His	Phe	Phe	Ser		
865							870				875				880		
Val	Leu	Ile	Ala	Arg	Asp	Gln	Leu	Glu	Gln	Ala	Leu	Asn	Cys	Glu	Ile		
					885					890					895		
Tyr	Gly	Ala	Cys	Tyr	Ser	Ile	Glu	Pro	Leu	Asp	Leu	Pro	Pro	Ile	Ile		
			900					905						910			
Gln	Arg	Leu	His	Gly	Leu	Ser	Ala	Phe	Ser	Leu	His	Ser	Tyr	Ser	Pro		
			915					920					925				
Gly	Glu	Ile	Asn	Arg	Val	Ala	Ala	Cys	Leu	Arg	Lys	Leu	Gly	Val	Pro		
			930				935				940						
Pro	Leu	Arg	Ala	Trp	Arg	His	Arg	Ala	Trp	Ser	Val	Arg	Ala	Arg	Leu		
945						950				955					960		
Leu	Ala	Arg	Gly	Gly	Lys	Ala	Ala	Ile	Cys	Gly	Lys	Tyr	Leu	Phe	Asn		
					965					970					975		
Trp	Ala	Val	Arg	Thr	Lys	Leu	Lys	Leu	Thr	Pro	Ile	Thr	Ala	Ala	Gly		
					980				985				990				
Arg	Leu	Asp	Leu	Ser	Gly	Trp	Phe	Thr	Ala	Gly	Tyr	Ser	Gly	Gly	Asp		
			995				1000					1005					
Ile	Tyr	His	Ser	Val	Ser	His	Ala	Arg	Pro	Arg	Trp	Phe	Trp	Phe	Cys		
			1010				1015				1020						
Leu	Leu	Leu	Leu	Ala	Ala	Gly	Val	Gly	Ile	Tyr	Leu	Leu	Pro	Asn	Arg		
1025					1030					1035					1040		

<210> 10

<211> 226

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis B virus S antigen (HBsAg) sequence

<400> 10

Met	Glu	Asn	Ile	Thr	Ser	Gly	Phe	Leu	Gly	Pro	Leu	Leu	Val	Leu	Gln		
1				5					10					15			
Ala	Gly	Phe	Phe	Leu	Leu	Thr	Arg	Ile	Leu	Thr	Ile	Pro	Gln	Ser	Leu		
				20				25					30				
Asp	Ser	Trp	Trp	Thr	Ser	Leu	Asn	Phe	Leu	Gly	Gly	Thr	Thr	Val	Cys		
				35			40					45					
Leu	Gly	Gln	Asn	Ser	Gln	Ser	Pro	Thr	Ser	Asn	His	Ser	Pro	Thr	Ser		
				50			55				60						
Cys	Pro	Pro	Thr	Cys	Pro	Gly	Tyr	Arg	Trp	Met	Cys	Leu	Arg	Arg	Phe		
65						70				75					80		
Ile	Ile	Phe	Leu	Phe	Ile	Leu	Leu	Leu	Cys	Leu	Ile	Phe	Leu	Leu	Val		
				85					90						95		
Leu	Leu	Asp	Tyr	Gln	Gly	Met	Leu	Pro	Val	Cys	Pro	Leu	Ile	Pro	Gly		
				100				105					110				
Ser	Ser	Thr	Thr	Ser	Thr	Gly	Pro	Cys	Arg	Thr	Cys	Met	Thr	Thr	Ala		
				115			120					125					
Gln	Gly	Thr	Ser	Met	Tyr	Pro	Ser	Cys	Cys	Cys	Thr	Lys	Pro	Ser	Asp		
				130			135					140					

Gly	Asn	Cys	Thr	Cys	Ile	Pro	Ile	Pro	Ser	Ser	Trp	Ala	Phe	Gly	Lys
145					150					155					160
Phe	Leu	Trp	Glu	Trp	Ala	Ser	Ala	Arg	Phe	Ser	Trp	Leu	Ser	Leu	Leu
				165					170						175
Val	Pro	Phe	Val	Gln	Trp	Phe	Val	Gly	Leu	Ser	Pro	Thr	Val	Trp	Leu
			180					185					190		
Ser	Val	Ile	Trp	Met	Met	Trp	Tyr	Trp	Gly	Pro	Ser	Leu	Tyr	Ser	Ile
		195					200					205			
Leu	Ser	Pro	Phe	Leu	Pro	Leu	Leu	Pro	Ile	Phe	Phe	Cys	Leu	Trp	Val
	210					215					220				
Tyr	Ile														
225															

<210> 11

<211> 212

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis B virus C antigen and e antigen
(HBcAg/HBeAg) sequence

<400> 11

Met	Gln	Leu	Phe	His	Leu	Cys	Leu	Ile	Ile	Ser	Cys	Ser	Cys	Pro	Thr
1				5					10					15	
Val	Gln	Ala	Ser	Lys	Leu	Cys	Leu	Gly	Trp	Leu	Trp	Gly	Met	Asp	Ile
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His	Thr	Ala	Leu	Arg	Gln	Ala	Ile	Leu	Cys	Trp	Gly	Glu	Leu	Met	Thr
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Tyr	Arg	Pro	Pro	Asn	Ala	Pro	Ile	Leu	Ser	Thr	Leu	Pro	Glu	Thr	Thr
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<210> 12

<211> 2227

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis A virus sequence

<400> 12

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Glu	Lys	Phe	Phe	Leu	Ile	His	Ser	Ala	Asp	Trp	Leu	Thr	Thr	His	Ala
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<211> 9416

<212> DNA

<213> Artificial Sequence

<220>

<223> Hepatitis C virus sequence

<400> 13

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